CBRN MODEL AND TOOL DESCRIPTION

VLSTRACK. Used to create hazard plumes (to include total area coverage, concentrations, etc.), primarily for chemical warfare agents. This information is then used to determine impact of the attack and/or likely effectiveness of proposed TTP modification.

HPAC. Used to create hazard plumes (to include total area coverage, concentrations, etc.), primarily for biological warfare agents and toxic industrial chemicals. This information is then used to determine impact of the attack and/or likely effectiveness of proposed TTP modification.

HOTSPOT. Used to create hazard plumes (to include total area coverage, concentrations, etc.), primarily for radiological materials. This information is then used to determine impact of the attack and/or likely effectiveness of proposed TTP modification.

JEM. This is the new DOD program of record for automated plotting of CBRN materials. As it is fully fielded and improvements are made to the analytical components of the program, it will be what is used for creating hazard plumes for CBRN attacks.

Excel. Used for a wide variety of projects; program is generally used within the context of automatically calculating and interpreting numbers (exposure rates, total exposures, percentages, etc.) associated with CBRN analysis.

Access. Used to capture and display (through different "filters") large quantities of information e.g., results of career field manager survey with ETE project.

RadPro Calculator. Used as reference for specific radiological items (half life of isotopes for example) and for calculation of hazard distance for radiological exposure devices (RED) in so far as the modification to the inverse square law is concerned (because inverse square law is based on calculations in a vacuum).

Convert. Used to convert units of measurement as needed (meters per second wind speed to miles or kilometers per hour for instance).

DPointe. Used for large projects (Master Plan Capability Assessment for instance) where ranking or prioritization of items in a cost-benefit analysis is desired.

Surfer. Used to facilitate transfer of graphics of CBRN hazard plumes onto maps or into PowerPoint from automated plotting programs that do not have a strong map component (VLSTRACK for instance).

HOTSPOT. Used for detailed radiological hazard plotting in regards to specific health related issues (lung doses, bone marrow doses, extent of reaerosolization hazard, etc.)

Models

(gov - DTRA) HPAC - Source terms, transport, dispersion, agent challenge, agent properties, hazard prediction. HPAC contains a wide range of threat systems for CBRN and TICs.

(gov - NSWC) VLSTRACK - Agent transport dispersion. Especially good at military CB weapon systems. Contains the best surface evaporation model. Good challenge output.

(gov - JPEO) JEM - Agent transport and dispersion. Similar to HPAC right now.

(gov - USAF) STAFFS - High resolution task network simulation system. Current database is for AF fight base operations. Integrated with VLSTRACK to determine agent challenge, casualties, and sortie degradation.

(gov - JPEO) NBC-CREST - Produces time resolved CB casualty streams. Input allows various CB pre/post treatments and personnel locations. Building effects taken into account.

(gov - LLNL) HOTSPOT - General purpose rad/nuclear dispersion program. Produces output plumes of rad dose rates and dose. Contains dose conversion factor tables, performs reaerosolization, and small nuclear devices.

(gov- NOAA) ALOHA - General purpose industrial release model. Handles a wide range of toxic materials with relatively simple release/source models. Gives very simple and limited challenge output (plumes).

(N/A - no owner) Barad-Hildst - General purpose and simple elevated line release model especially useful for aerial delivered bio agents.

(gov - USASMDC) PEGEM - Post engagement effects model. Handles CB filled missile intercept cases. Predicts warhead lethality, agent evaporation and diffusion as the agent settles to the ground.

(gov - EPA) DEGADIS - Heavy gas transport and dispersion model used for industrial releases.

(gov - DTRA) STEP - Agent dispersion within compartments.

(gov - USAF) SERPENT - Complex agent defeat model.

(University of Tuebingen, Germany) InFluSim - Models the spread of pandemic influenza and other contagious diseases.

(gov - DOE) ADPIC - Particle in cell transport and dispersion model. Utilizes random walk technique (vice Gaussian puff).

(Titan Corp.) SCIPUFF - General purpose Gaussian puff model used in HPAC. Main feature is its ability to output challenge standard deviation values and time constants as opposed to most models that only output mean fields.

(gov - JPEO) JOEF prototype - General purpose operational effects model. Prototype is of limited utility.

(gov - USAF) DREAM - Higher resolution agent evaporation model for porous and non-porous substrates. Currently being developed by AFRL.

Tools/Calculators

(gov - USAF) CHEMRAT - Chemical agent hazard duration prediction tool.

(gov - USAF) AFRAT - Similar ot CHEMRAT but utilizes map base challenge locations as opposed to CHEMRAT random challenge location.

(gov - USAF) CHART - Simple dose/response tool for calculating casualty probability for a given dose.

(SYBERAD LIMITED) HPC - Health Physicists Companion - General purpose radiation effects, properties, and hazards tool. Contains data for all radio-isotopes.

(MIT) RadPro - Simple radiation decay and dose rate tool. Contains properties for many radio-isotopes.

(Microsoft) Excel - Spreadsheet.

(SPSS) SPSS - General purpose statistical package.

(Mathworks) MATLAB - Mathematical modeling package with emphasis on linear algebra applications.

(MiniTab) MiniTab - General purpose statistics package.